Draft Maricopa Region 9-1-1 Status Report and Outlook Prepared by the MAG 9-1-1 Study Committee

January 25, 2017

MARICOPA ASSOCIATION of GOVERNMENTS

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Foreword

In September 2016, the MAG Management Committee formed the MAG 9-1-1 Study Committee in response to growing pressures to find solutions to continue delivering high quality 9-1-1 services to the region. The MAG 9-1-1 Study Committee undertook a process to learn and discuss the history, current state and future outlook of Maricopa Region 9-1-1 with regard to fiscal and technical issues. This document is a result of that effort and is intended to be a starting point for policy considerations in how the region will continue providing 9-1-1 services.

The Co-Chairs would like to thank members of the MAG 9-1-1 Study Committee for their input during this process. The members of the MAG 9-1-1 Study Committee are as follows:

Co-Chairs

Chris Brady, City Manager, City of Mesa

Kevin Phelps, City Manager, City of Glendale

MAG 9-1-1 Oversight Team

Jay Strebeck, Assistant Chief, Phoenix Fire Dept., Chair
John Locklin, Battalion Chief, Mesa Fire Dept., Vice Chair

MAG Public Safety Answering Point Managers

Domela Finnessey, City of Surprise, Chair
Michelle Potts, City of Chandler, Vice Chair

Police Departments

Chief Larry Rodriguez, City of Tolleson
Chief Roy Minter, City of Peoria
Chief Sylvia Moir, City of Tempe
Jesse Cooper, Police Administrator of Communications Bureau, City of Phoenix

MAG Technical Advisory Group

Dan Cotterman, City of Goodyear, Chair

For any questions related to this report, please contact Liz Graeber, Maricopa Region 9-1-1 Administrator (liz.graeber@phoenix.gov) or Nathan Pryor, MAG Government Relations Manager (npryor@azmag.gov).

Summary

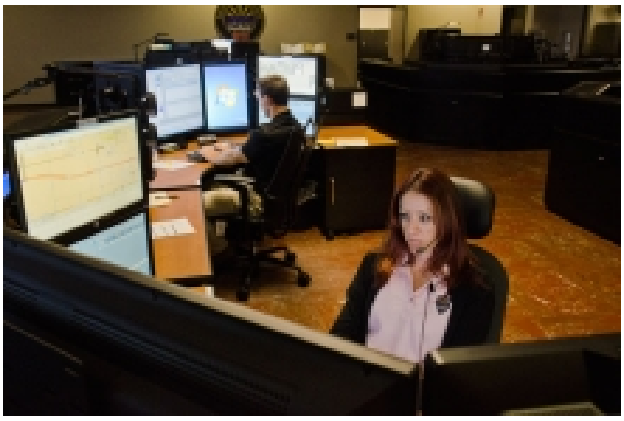
9-1-1 in the Maricopa Region

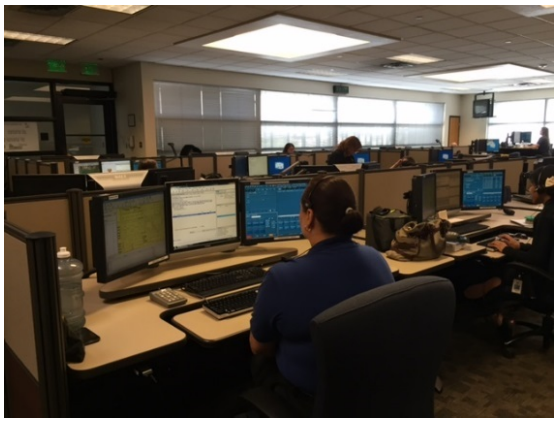
The 9-1-1 Emergency Number System provides a universal telephone number for emergency use throughout the United States. Planning for the Maricopa Region 9-1-1 (MR 9-1-1)system was begun many years ago, before state requirements were established for 9-1-1 system planning. 9-1-1 service began in the Maricopa Region September 9, 1985.

When the 9-1-1 system was established in 1985, the telephone company required that only one agency be authorized by all of the cities and towns to act on behalf of the system. The City of Phoenix, through resolutions by the MAG member agencies, was designated as the contract agent for the system in 1989. This included oversight of the overall implementation of the MAG 9-1-1 system and maintenance of the system's PSAPs. (See Attachment A for the City of Scottsdale example).

MR 9-1-1 oversees the annual 9-1-1 budget, maintenance, and installation of the 9-1-1 system. They also act as a liaison between the State Department of Administration 9-1-1 Office and the member agencies. The MR 9-1-1 Maintenance Team provides 24x7 maintenance for the 26 PSAPs throughout the greater Phoenix area. There are approximately 360 call taking positions, which process 3.2 million 9-1-1 calls annually.

The MAG Public Safety Answering Point (PSAP) Managers Group consists of PSAP Managers from the MAG member agencies. This Group oversees the technical needs and provides overall coordination of the Maricopa Region 9-1-1 System. They meet on a quarterly basis with MR 9-1-1 to discuss 9-1-1 issues and take necessary actions to safeguard 9-1-1.





Currently, 9-1-1 calls are received from landline telephones, wireless telephones, and Voice Over Internet Protocol (VoIP) telephone systems. The 9-1-1 operator receives the voice of the 9-1-1 caller as well as data giving the caller’s location and telephone number. The location information received is delivered in a variety of methods:

- The landline 9-1-1 call goes through a process that acquires the location information associated with the telephone number being used to call 9-1-1 from a database that holds all landline customer records.

- Wireless 9-1-1 calls are processed by the 9-1-1 system capturing the global positioning system (GPS) information that is being transmitted through the cell phone's GPS chip. That information is plotted on a 9-1-1 mapping system located at the 9-1-1 call taker's work station. This is called 9-1-1 Wireless Phase II. Wireless calls make up for 80 percent of the 9-1-1 calls in the Maricopa Region.

- VoIP 9-1-1 calls are delivered from the internet to the 9-1-1 system through the VoIP carrier service interface with the public telephone network. The location information is provided by a customer self-registered address.

9-1-1 Budget Process

The MR 9-1-1 Office is responsible for processing the budget requests in the MAG 9-1-1 System area. The State budget year begins July 1st and ends on June 30th of the following year. In order to meet the deadline, set forth by the State 9-1-1 Administrative Code, the PSAP Managers have the responsibility of making requests for their yearly needs along with projected needs for the next five years. Call statistics, equipment malfunction, and manufacturer recommendations are a sampling of the types of justification needed to support a budget request. The PSAP budget requests, along with 9-1-1 infrastructure needs, are compiled to create the forthcoming fiscal year budget. The proposed budget goes through the MAG approval process before it is submitted to the State 9-1-1 Office for funding approval.

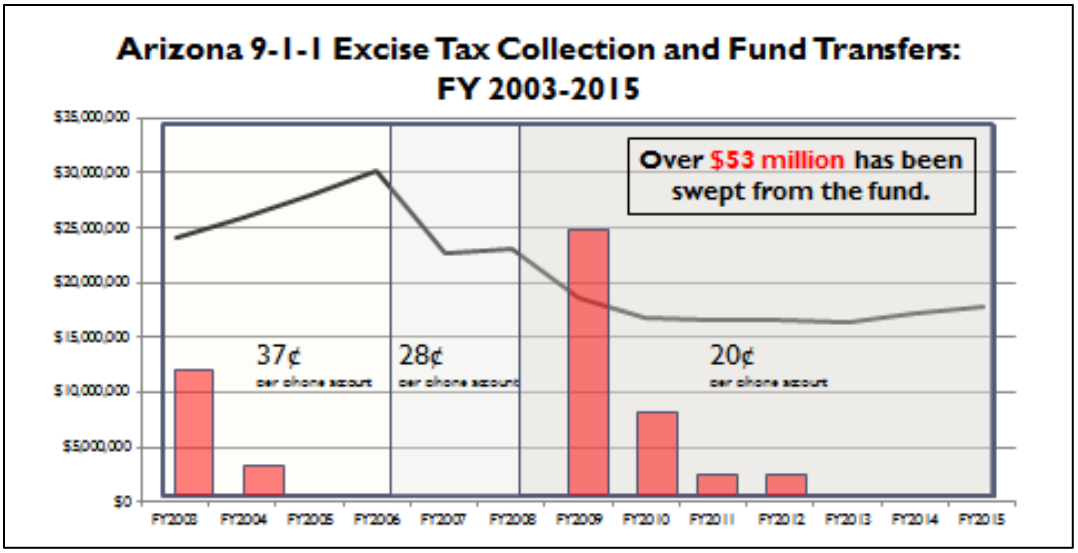
9-1-1 Funding

The 9-1-1 system and its equipment are funded by a revolving fund administered by the Arizona Department of Administration (ADOA). This fund derives its revenue from an excise tax on telephones.

The original 9-1-1 excise tax was 37 cents for wireline and wireless telecommunications access services. Existing legislation reduced the tax to 28 cents for wireline and wireless telecommunications in FY 2007 with a further reduction to 20 cents in FY 2008. This results in a 46 percent reduction of the state 9-1-1 fund. Additionally, approximately $53 million in fund sweeps from the 9-1-1 fund to the state general fund have occurred on and off since 2003.

Approximately $18 million is now collected annually and distributed to the 9-1-1 systems throughout the state. The annual collection has fallen short of the 9-1-1 system requirements and requests. The State 9-1-1 Office has put restrictions on 9-1-1 fund distribution and has issued what 9-1-1 equipment and services that will no longer qualify for funding:

- Reimbursement for logging recorders.
- Additional 9-1-1 call taking work stations.
- New PSAPs.
- New 9-1-1 mapping equipment and mapping infrastructure.
- New records and reports packages.
- Support for Community Emergency Notification System (Reverse 9-1-1) applications.



The Maricopa Region has had approximately $19 million in funding requests denied since 2010 due to the lack of 9-1-1 funding. These funding shortages have impacted the 9-1-1 systems not only in the Maricopa Region but throughout the state. Examples of the 9-1-1 system shortfalls due to lack of funding are:

- Significant delay on replacing aging 9-1-1 equipment.
- Unable to fund additional 9-1-1 equipment needed to match 9-1-1 call volume increases
- No funding available for new PSAPS (City of Maricopa and Mesa Fire in the MAG Region).
- Unable to fund a strong, carrier redundant IP network needed for Next Generation 9-1-1 required for text to 9-1-1, pictures to 9-1-1, or telematics (vehicle crash notifications).
- Wireless 9-1-1 Phase II (X/Y location) is not completely available across state due to lack of funds for wireless carriers requiring cost recovery.

Since 2010, all funding requests involving 9-1-1 equipment replacement submitted to the State 9-1-1 Office have been given a “conditional” approval based on the availability of 9-1-1 funds. The State 9-1-1 Office analyzes the 9-1-1 fund collection in the last quarter of the fiscal year to check for availability of funds for 9-1-1 equipment with “conditional” approval. If the monies are available, the State 9-1-1 Office notifies the 9-1-1 System coordinator with the approval and then the replacement project begins.

Future of 9-1-1

For a number of years, public safety organizations around the world have been programmed to expect the dawn of a new era for 9-1-1 technologies. This movement took on the moniker of Next Generation 9-1-1 (NG911). The National Emergency Number Association (NENA) continues more than a decade of effort to evolve the NG911 body of work intent on promoting associated NENA Standards. A large part of the desired standardized NENA NG911 technology and capability revolves around the use of Internet Protocol (IP) as a common transport for advanced 9-1-1 applications. The Maricopa Region 9-1-1 system has taken steps on moving to an Internet Protocol (IP) based phone system using the NENA standards as guidelines. The legacy analog 9-1-1 systems are unable to process IP data that many citizens use through their

cell phones, smart phones, and vehicle telematics. An IP based 9-1-1 system with a strong IP based backbone should be able to:

- Accept 9-1-1 calls from legacy and IP delivery
- Receive text-to-911 messages
- Connect with telematics services for crash notifications
- Receive picture/video feeds
- Transfer 9-1-1 calls to other IP 9-1-1 systems nationwide

The NENA NG911 standards require an IP based 9-1-1 system with a higher level of design and features to support this type of 9-1-1 system. That design should include the following elements:

Security: The system must have a comprehensive network security plan. Internal firewalling and detection systems would need to be in place to protect the 9-1-1 system from any outside threats.

System Management: Monitoring tools should be in place to provide system metrics and alarms in near real time along with detailed performance analysis for 9-1-1 calls.
Resiliency: Continuous operations must be maintained with no interruptions in 9-1-1 calls for service.

Diversity: The system must accommodate multiple telephony and multiple telecommunications providers. Single providers' issues such as cable cuts, flooded telecom facilities and human error are mitigated by employing multiple paths and providers

The Maricopa Region PSAPs have begun to move to an IP platform that would allow IP traffic to be delivered to the PSAPs. The 9-1-1 network used in the Maricopa Region provides three carrier diverse network providers to 15 of the 26 PSAPs. The other eleven PSAPs have two carrier diverse network providers with a goal to bring all PSAPs to the three carrier diverse providers level.

The current 9-1-1 network provides the building blocks for an IP end-to-end 9-1-1 call delivery that could meet the needs evolution of the modern 9-1-1 system. Expanding on that 9-1-1 network could lead to a stronger, modern, IP based 9-1-1 system that would meet the growing needs of the Maricopa Region community.

9-1-1 in the Maricopa Region

Beginnings of 9-1-1

In 1978, a MAG 9-1-1 Technical Advisory Committee was formed to review the process for implementing a 9-1-1 emergency telephone system for the citizens of Maricopa County. Members of the Committee included representatives from the majority of public safety agencies within Maricopa County. The Technical Advisory Committee recommended that a study be funded on the Implementation of this system. The consulting firm Michaud, Cooley, Hallberg, Erickson & Associates, Inc. was selected to conduct the study. Based upon the study recommendations, MAG recommended supporting the Implementation of an Enhanced 9-1-1 system for Maricopa County.

In 1978, Mountain Bell was ordered by the Arizona Corporation Commission to refund $14 million in revenues received from telephone subscribers. It was anticipated that some of these monies would remain after the refunds had been made and that the remaining funds could be used to purchase equipment for a 9-1-1 system. MAG approached the Arizona Corporation Commission regarding the initial funding for a 9-1-1 system. In December 1981, the Corporation Commission allocated $4.6 million of the refund money to agencies to purchase and install 9-1-1 systems throughout the State, including Maricopa County.

In 1983, former Governor Bruce Babbitt signed Senate Bill 1358, which formed the Emergency Telecommunications Services Revolving Fund. This fund, which derives its revenue from an excise tax on telephone service, is used for Implementation and operating costs for 9-1-1 systems throughout Arizona.

Also in 1983, the MAG 9-1-1 Technical Advisory Committee began the development of a master street address guide (MSAG) to define the relationship between emergency service agencies and their areas of service provision. There were 20 agencies defined as having initial call answering requirements within the Maricopa County service area. These agencies became primary public safety answering points (PSAPs). A PSAP is a call center responsible for answering calls to 9-1-1. Six additional agencies were identified as having secondary call handling capabilities and became secondary PSAPs. Another six agencies were defined as transfer points to provide additional call handling capabilities for callers within their respective service area. These activities led to a successful system cutover on September 9, 1985.

When the 9-1-1 system was established, the tariff required that only one agency be authorized by all of the cities and towns to act on behalf of the system. The City of Phoenix, through resolutions by the MAG member agencies, was designated as the contract agent for the system in 1989. This included oversight of the overall implementation of the MAG 9-1-1 system and maintenance of the system's PSAPs. (See Attachment A for the City of Scottsdale example).

Introduction of Wireless 9-1-1

The original 9-1-1 calls received were from traditional, landline telephones. In the early 1990's, 9-1-1 calls from cell phones began to appear. 9-1-1 calls from wireless devices lacked vital information for the 9-1-1 operator; no caller location, phone number, or name were provided. Because the cell phone calls had no location information available, all wireless 9-1-1 calls were default routed to the Maricopa County Sheriff's Office (MCSO) who then transferred the call to

the appropriate PSAP. As cell phones began to be more prevalent, nine PSAPs in the MAG region were identified to receive wireless 9-1-1 calls. Not knowing the telephone number and location of cell phone callers presented problems, and the Federal Communications Commission (FCC) identified this as a nationwide issue and mandated that wireless carriers come up with a solution to deliver wireless 9-1-1 calls with a caller's telephone number and location to the appropriate PSAP. In 1996, the FCC ordered the enhancement of wireless 9-1-1 services, which included being able to identify the specific location of the caller.

The Maricopa Region 9-1-1 Maintenance Team

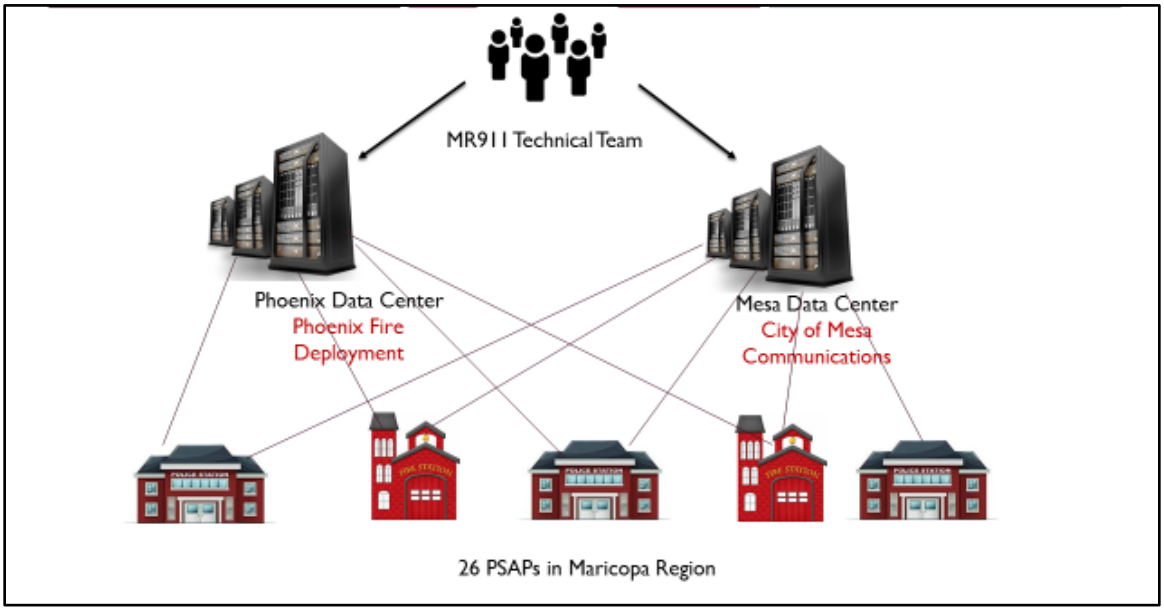
Maintenance to the 9-1-1 system had been provided by the local telecom carrier in the Maricopa Region. PSAPs in the MAG region requested an alternative to 9-1-1 maintenance. The PSAPs issued a request for proposals for 9-1-1 maintenance. After reviewing the responses, the decision was made to move to a 9-1-1 self-maintenance model. Approval was received from the MAG Regional Council and the State 9-1-1 Office to form this technical team to oversee maintenance of the 9-1-1 system in the Maricopa Region. In June 2003, the Maricopa Region 9-1-1 Technical Team was hired and in July of 2004, the 9-1-1 self-maintenance model began. The MR 9-1-1 Maintenance Team provides 24x7 maintenance for the 26 PSAPs throughout the greater Phoenix area.

Wireless Phase II Project

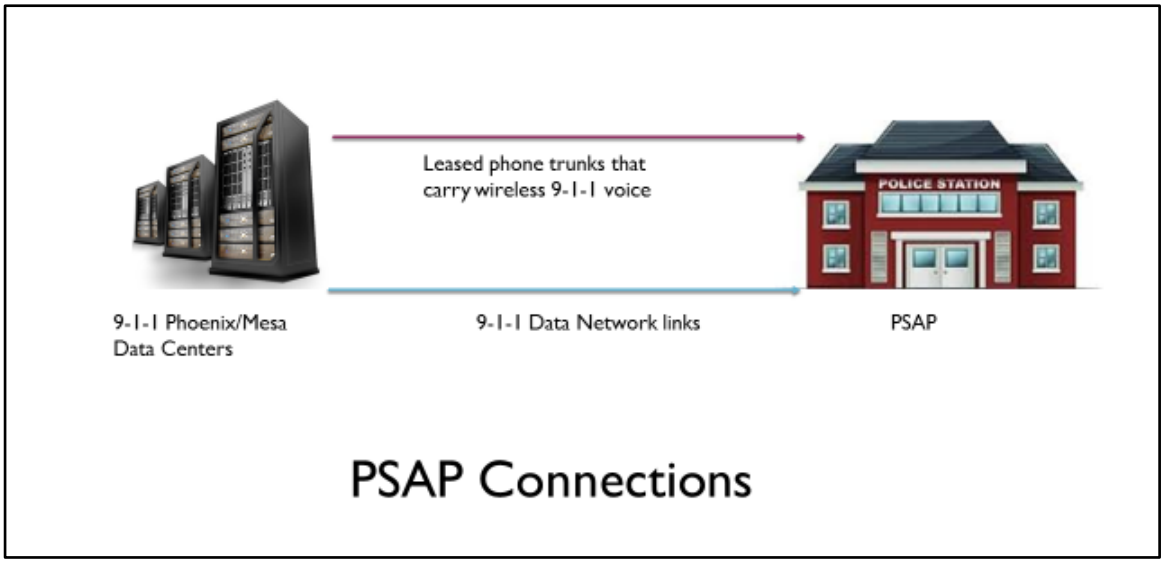
The second purpose of MR 9-1-1 having its own maintenance team was to design and implement a system that would deliver wireless 9-1-1 calls to the appropriate PSAP with the caller's phone information and a location of the caller. The MR 9-1-1 Team had a list of tasks to start this project:

- Establish network centers to act as hubs for selective routing equipment and the 9-1-1 data network
- Build a reliable 9-1-1 network for data delivery
- Select a product that would route wireless 9-1-1 calls according to cell tower/sector location
- Compile GIS data for the entire MR 9-1-1 area
- Select a 9-1-1 mapping product for 9-1-1 call taking positions throughout region
- Build a map layer with all cell phone towers/sector information

The cities of Phoenix and Mesa allowed MR 9-1-1 to place its equipment in spare space they had at the Phoenix Fire Department and the City of Mesa Communications buildings. These locations offered 24-hour access, building security, back-up power sources, etc., at very little cost other than the equipment. These locations also offered the new 9-1-1 network centers to have geodiversity with a 13-mile separation.

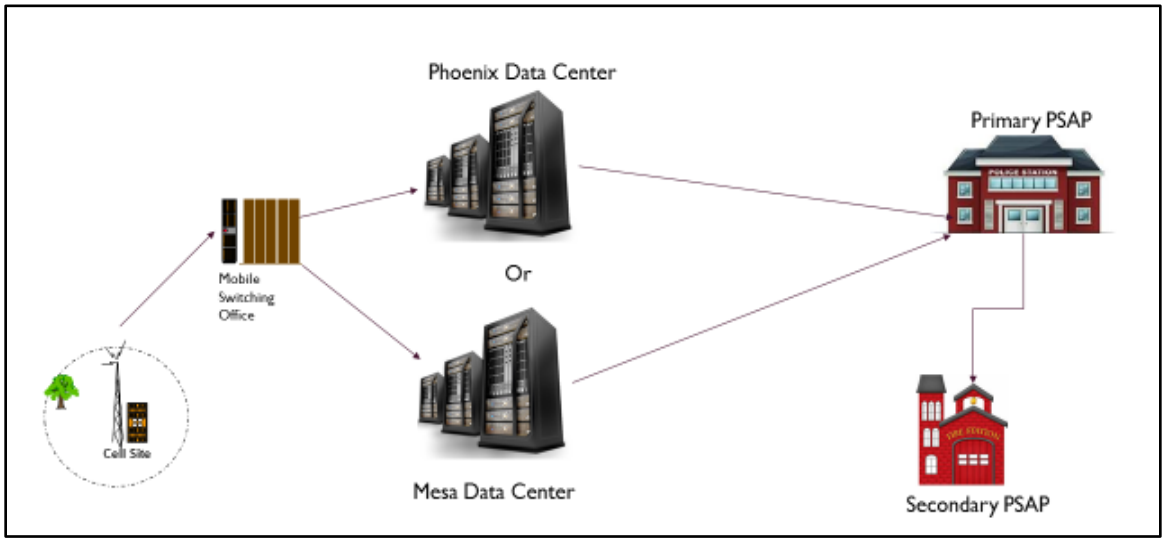


Once the 9-1-1 network centers were established, phone trunks were leased to carry wireless 9-1-1 voice calls from each PSAP to each network center. 9-1-1 data network links then needed to be established to connect with each PSAP.



The original 9-1-1 data network transported 9-1-1 call data location, telephone number, and X/Y coordinates and allowed secure remote access for the MR 9-1-1 Technical Team. This allowed the technicians to troubleshoot on issues immediately instead of creating service delays due to traveling time to the PSAP. The networking connection of the PSAPs allowed the 9-1-1 mapping enterprise solution to push mapping updates to PSAP mapping servers.

In May of 2005, the process of testing and validating each cell phone tower began. The cellular tower sends the 9-1-1 call to the mobile switching office, which is connected to the MR 9-1-1 network centers at Phoenix and Mesa, which work in tandem. The selective router sends the call to the primary PSAP, which can transfer the call to the secondary PSAP if required. The operator receives the voice and the call data associated with the 9-1-1 call.



A test 9-1-1 call had to be made and the 9-1-1 operator was required to verify the information they received on each 9-1-1 wireless test call. Approximately 8,000 cell sectors had to be tested with seven different wireless carriers. This resulted in thousands of calls being placed at all 26 PSAPs. The project successfully completed in November of 2005.

9-1-1 Call Handling Today

Currently, 9-1-1 calls are received from landline telephones, wireless telephones, and Voice Over Internet Protocol (VoIP) telephone systems. The 9-1-1 operator receives the voice of the 9-1-1 caller as well as data giving the caller's telephone number and location. The location information received is delivered in a variety of methods:

- The landline 9-1-1 call goes through a process that acquires the location information associated with the telephone number being used to call 9-1-1 from a database that holds all landline customer records.

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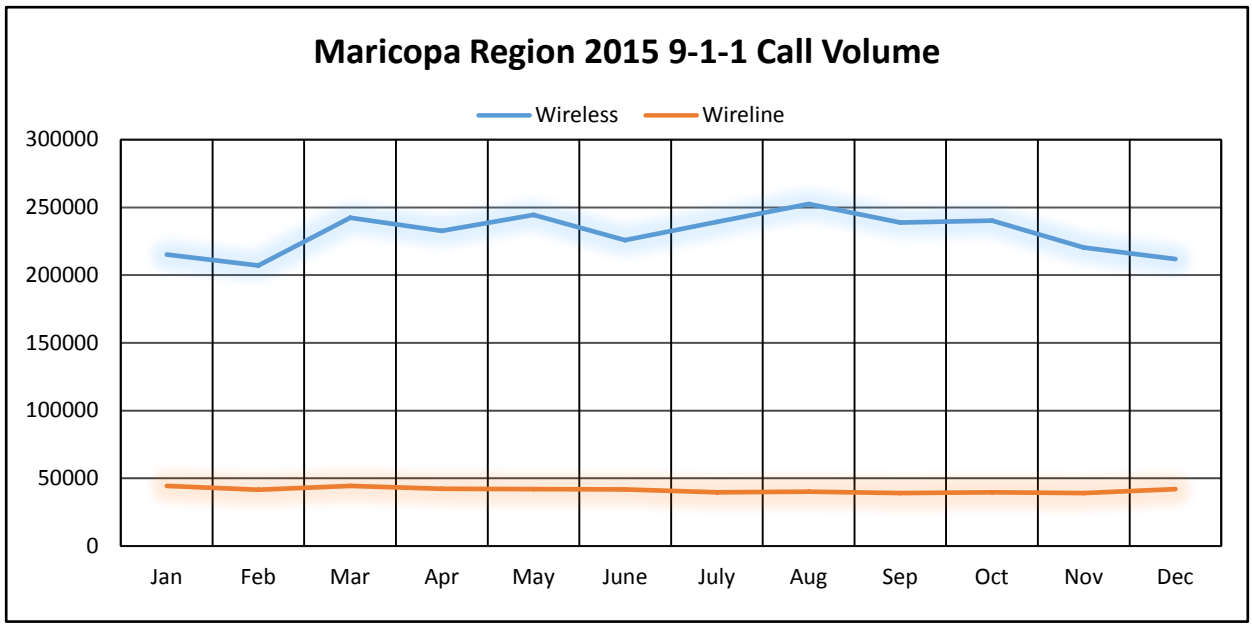


Speech/Hearing Impaired Calls

The Maricopa Region 9-1-1 PSAPs are dedicated to supporting all 9-1-1 emergency calls received.

The Department of Justice has mandated: *"The Americans with Disabilities Act (ADA) requires all Public Safety Answering Points (PSAPs) to provide direct, equal access to their services for people with disabilities who use teletypewriters (TTYs), which are also known as telecommunications devices for the deaf (TDDs)."*

The Arizona State Administrative Code R2-1-407.2 sets a 9-1-1 system design standard that requires *"Each telephone position with the capability of answering or handling 9-1-1 calls shall be equipped with the necessary interface to communicate with TDD/TTY devices for communications with hearing-impaired individuals in accordance with the Americans with Disabilities Act…"*

The Maricopa Region 9-1-1 PSAPs adopted the following guidelines for each PSAP in the region to follow when handling 9-1-1 calls:

1. Call-takers must be aware of the Speech/Hearing Impaired Community and of the possibility of receiving emergency calls from Teletypewriters (TTY), also known as Telecommunication Device for the Deaf (TDD) users.
2. When a call comes in to 9-1-1 and no voice is heard, the call-taker should be aware of the possibility of the electronic tones associated with a TTY machine. When these tones are heard, the call must be completed using the TTY.
3. Silent calls should be assumed to be a hearing impaired caller and communication must be attempted with the TTY.

Smart telephones have developed the capability of sending out TTY tones enabling hear or speech impaired callers to communicate with their PSAP. All open 9-1-1 calls where no voice is heard must have a TTY challenge regardless of the device making the 9-1-1 call.

Community Emergency Notification System (Reverse 9-1-1)

The Community Emergency Notification System, also known as Reverse 9-1-1, is a computerized telephone dialing system that quickly notifies Valley residents in English and Spanish of emergencies (imminent threats to life or property, disaster notification, endangered children and elderly, and evacuation notices).

The Community Emergency Notification System was originally funded through settlement funds from an environmental lawsuit brought against a private company for a violation in the MAG region. The judge designated that the settlement funds of $3.5 million would be used to establish and implement an emergency notification system for the MAG region. The Community Emergency Notification System was launched in the MAG region in 2004. The System is available to emergency response agencies valleywide and notifications are coordinated through the 26 PSAPs centers in the Maricopa Region.

Allowable costs in the Emergency Telecommunications Fund do not cover emergency notification systems. When the original settlement funds were depleted, MR 9-1-1 pursued grants to support the Community Emergency Notification System. Currently, an annual Homeland Security grant funds the costs for the System.

9-1-1 Funding

Emergency Telecommunications Excise Tax

In 1983, former Governor Bruce Babbitt signed Senate Bill 1358 forming the Emergency Telecommunications Services Revolving Fund, which obtains its revenue from an excise tax on telephone service.

The 9-1-1 system and its equipment are funded by the Emergency Telecommunications Services Revolving Fund administered by the Arizona Department of Administration (ADOA). The ADOA distributes two percent of the annual budget for the administrative costs of 9-1-1. In 2001, the 9-1-1 excise tax was 37 cents for wireline and wireless telecommunications access services. Existing legislation reduced the tax to 28 cents for wireline and wireless telecommunications in FY 2007 with a further reduction to 20 cents in FY 2008. This results a 46 percent reduction of the state 9-1-1 fund.

> *A.R.S. § 42-5252 A. A tax is levied on every provider in an amount as follows:*
>
> 1. *For the fiscal years beginning from and after June 30, 2001 and ending before July 1, 2006, thirty-seven cents per month for each activated wire and wireless service account for the purpose of financing emergency telecommunication services.*
>
> 2. *For fiscal year 2006-2007, twenty-eight cents per month for each activated wire and wireless service account for the purpose of financing emergency telecommunication services.*
>
> 3. *For the fiscal years beginning from and after June 30, 2007, twenty cents per month for each activated wire and wireless service account for the purpose of financing emergency telecommunication services.*

Administration of the revolving fund, A.R.S. § 41-702.01, outlines the duties of the ADOA Director. This includes adopting rules and procedures for administering and disbursing monies deposited in the fund and at least quarterly, reviewing and approving requests by political subdivisions of the State for payment for operating emergency telecommunication service systems.

A.R.S. § 41-702.01 also outlines what the fund shall be used for which includes:

- Necessary or appropriate equipment or services for implementing and operating emergency telecommunication services through political subdivisions of the State.
- Necessary or appropriate administrative costs or fees for consultants' services, not to exceed five percent of the amounts deposited annually in the revolving fund.
- Monthly recurring costs of emergency telecommunication services, Including expenditures for capital, maintenance and operation purposes.

In addition, the statute states that at the end of each fiscal year, any unexpended monies in the fund, including interest, shall be carried over and do not revert to the general fund but shall be applied, to the extent possible, to reduce the levy under A.R.S. § 42-1472.

The FCC collected 9-1-1 fee information from each state for its *Seventh Annual Report to Congress on State Collection and Distribution of 9-1-1 and Enhanced 9-1-1 Fees and Charges* (Attachment B). **That report lists Arizona's 20 cent per month fee as the lowest monthly fee collection of the 48 of the 50 states that follow that collection model.**

9-1-1 Budgeting Process

The MR 9-1-1 Office is responsible for processing the budget requests in the MAG 9-1-1 System area. The State fiscal year begins July 1st and ends on June 30th of the following year. In order to meet the deadline set forth by the State 9-1-1 Administrative Code, the PSAP Managers have the responsibility of making requests for their yearly needs along with projected needs for the next five years. Call statistics, equipment malfunction, and manufacturer recommendations are a sampling of the types of justification needed to support a budget request. The PSAP budget requests are compiled along with 9-1-1 infrastructure needs to create the forthcoming fiscal year budget. For the MAG region, the proposed budget goes through the MAG committee approval process before it is submitted to the State 9-1-1 Office for funding approval.

Maricopa Region 9-1-1 Budget Time Line

April - Notification of budget process distributed to PSAP Managers from MAG Office.
June - Deadline for budget requests and justification returned to the MR 9-1-1 Administrative Office. This includes the yearly requests and the five-year plan requests.
August - All budget requests and justifications presented to the MAG PSAP Managers Group for a recommendation of approval.
September - October - Recommended budget request presented to the MAG 9-1-1 Oversight Team and MAG Management Committee for a recommendation of approval and to the MAG Regional Council for final approval.
December 15th – MR 9-1-1 Office sends copy of approved requests to the State 9-1-1 Office.

Budget Components

Four components comprise the MR 9-1-1 budget. They include: costs for wireline infrastructure, costs for wireless 9-1-1 infrastructure, maintenance, and 9-1-1 equipment.

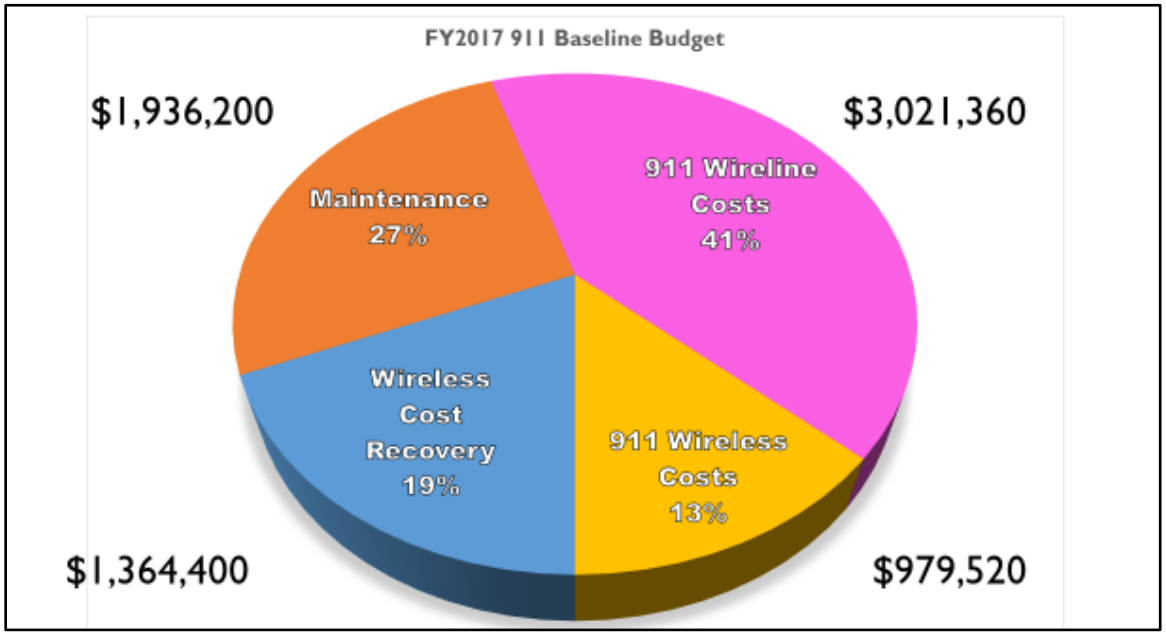
Wireline Infrastructure: Costs associated with landline 9-1-1 call delivery and management by CenturyLink. These include cost recovery paid to the wireline telecom providers for charges they incur interfacing with the CenturyLink 9-1-1 system.

Wireless Infrastructure: Costs associated with wireless call delivery and management by MR 9-1-1. These include cost recovery paid to the wireless carriers for charges they incur interfacing with the MR 9-1-1 system.

9-1-1 Maintenance: Costs associated with the MR 9-1-1 Technical Team, third party service contracts, software support contracts, and spare parts kept for maintenance purposes.

9-1-1 Equipment: Replacing aging 9-1-1 equipment at the PSAPs and aging wireless 9-1-1 infrastructure equipment used for networking and wireless call delivery.

The wireline infrastructure, the wireless infrastructure, and the maintenance components are considered to be part of a baseline budget. A baseline budget includes items that have monthly recurring costs needed to keep 9-1-1 up and running. Equipment replacement is not considered part of the baseline budget.



The PSAPs in the Maricopa Region submitted budget requests for the following equipment for FY 2017:

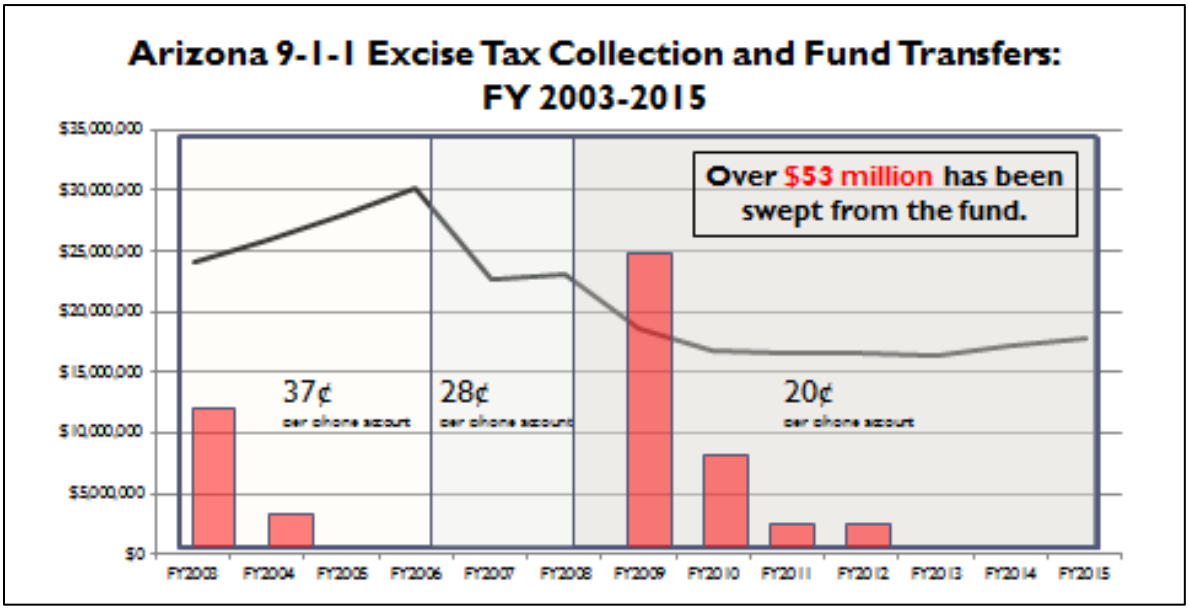
Equipment:		
Upgrade Peripherals		*$50,000*
ASU PD	911 System Upgrade	*$165,000*
ASU PD	One position, logging recorder	*$150,000*
Avondale PD	911 System Upgrade	*$250,000*
DPS	logging recorder	*$150,000*
Fort McDowell PD	911 System Upgrade	*$60,000*
Gilbert PD	911 System Upgrade	*$350,000*
Mesa Fire	6 positions, logging recorder	*$300,000*
Phoenix Fire	logging recorder	*$250,000*
Phoenix PD	911 System Upgrade	*$4,000,000*
Peoria PD	911 System Upgrade	*$450,000*
	Equipment Totals	*$6,175,000*

9-1-1 Funding Struggles

Statewide Impact

The Arizona 9-1-1 excise tax collection decreased from 37 cents per phone line in 2003, to 28 cents per phone line in 2006, to 20 cents per phone line in 2008 going forward to the present. The 9-1-1 fund also was impacted by fund sweeps by the Legislature. The Emergency Telecommunications Service Fund or 9-1-1 Fund has had money reallocated to cover state general fund shortages.

Declining revenues, combined with 9-1-1 fund transfers of more than $53 million to the State General Fund since 2003, has resulted in a 46 percent reduction of the state 9-1-1 fund.



9-1-1 Funding Suspension

The State 9-1-1 Office has suspended 9-1-1 funds to certain items due to shortfalls in 9-1-1 fund collections. Historically approved 9-1-1 expenditures no longer include:

- Reimbursement for logging recorders
- Additional 9-1-1 call taking work stations to accommodate growth
- New PSAPs (City of Maricopa Police, Mesa Fire in the MR 9-1-1 Region)
- New 9-1-1 mapping equipment and mapping infrastructure
- New records and reports packages
- Support for Community Emergency Notification System (Reverse 9-1-1) applications
- Costs associated with text-to-9-1-1

The State 9-1-1 Office has indicated that “the program may only be able to support the legacy network and maintenance components for the 9-1-1 Systems, and not equipment upgrades.

The effect of aging 9-1-1 PSAP equipment has become a reality and the costs may have to be undertaken by the PSAPs in the future." (State of Arizona Joint Legislative Budget Committee. Emergency Telecommunication Services Revolving Fund Expenditure Plan. 2016)

In 2010, equipment requests have become approved "conditional" items. The State 9-1-1 Office will fund these equipment items on the condition that monies remain in the fund at the end of the fiscal year to pay for the equipment. The State 9-1-1 Office has to meet the costs of the networking and day-to-day costs to keep 9-1-1 operating which are part of the baseline budget.

Maricopa Region Impact

The State 9-1-1 Office releases to MR 9-1-1 the approved 9-1-1 budget each June. The budget will reflect what budget items are approved, what items are "conditionally" approved, and what items are denied funding.

The following spreadsheet reflects 10 years of budget numbers from the MR 9-1-1 Office and the State 9-1-1 Office.

10 Year Maricopa Region 9-1-1 Budget Summary:

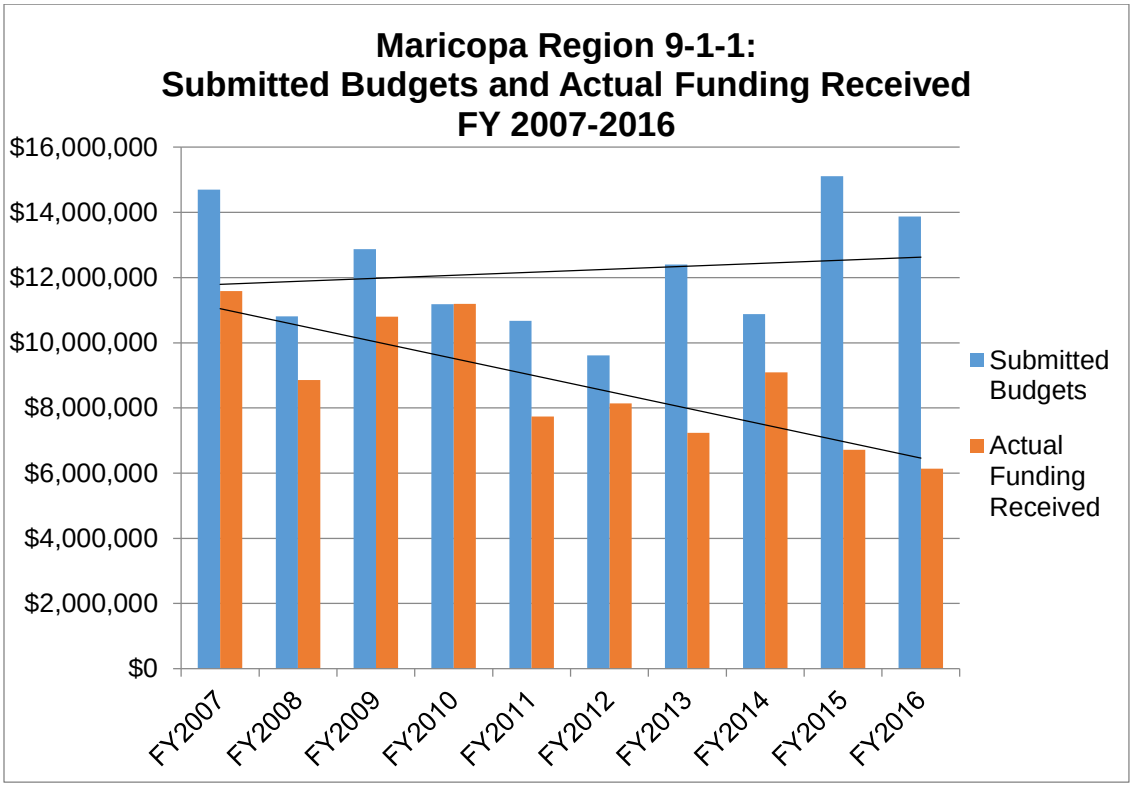
Budgets	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017
Submitted Budget	$14,701,000	$10,814,837.04	$12,874,609.40	$11,184,936	$10,670,472	$9,608,304	$12,399,704	$10,881,564	$15,113,699	$13,869,689	$15,386,096
Approved Baseline Budget	$14,701,000	$10,814,837.04	$12,874,609.40	$11,184,936	$9,634,704	$7,725,504	$7,710,024	$10,453,284	$7,781,976	$8,209,288.27	$9,763,464
Conditional Funding	0.00	0.00	0.00	0.00	0.00	0.00	$2,095,000	0.00	$4,000,000	$3,803,508.27	$5,125,000
Denied Funding	0.00	0.00	0.00	0.00	$453,000	$150,000	$2,477,800	$927,800	$2,950,140	$1,979,140	$1,899,100
Actuals	$11,589,135.04	$8,857,594.29	$10,802,622.26	$11,197,063.65	$7,737,468.43	$8,134,635.73	$7,239,048.31	$9,094,463.66	$6,714,755.52	$6,137,356.57	

- **Submitted budget**: 9-1-1 budgets submitted to the State that have been approved by the MAG Regional Council.
- **Approved Baseline budget**: includes the amounts for day-to-day costs to keep 9-1-1 running, such as networking and maintenance.
- **Conditional budget:** includes equipment replacement projects the State 9-1-1 Office will fund if sufficient money remains in the budget at the end of the fiscal year.
- **Denied funding**: includes the amounts the State 9-1-1 Office will not support due to lack of funding.
- **Actual:** total amounts of actual monies spent at the end of that fiscal year.

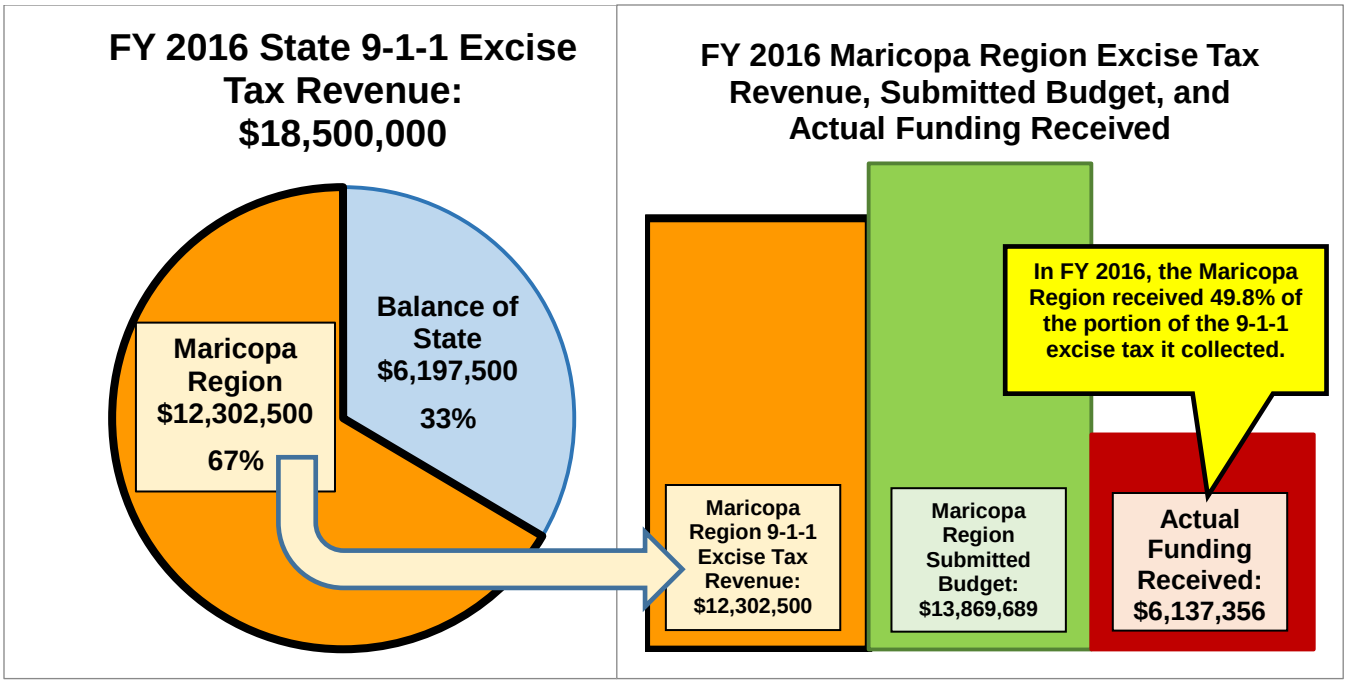
Any monies not spent in the MR 9-1-1 budget are rolled back into the State 9-1-1 fund to be applied to priority projects throughout the state. Those remainders are not used by MR 9-1-1 to cover budget shortages. Several vital equipment replacement projects that were given a conditional approval were not funded. As a result, Phoenix Police Department's 9-1-1 project was not funded in FY 2015 or in FY 2016.

As stated earlier, the State 9-1-1 Office has placed a restriction on the items 9-1-1 funds will support. The Maricopa Region PSAPs have submitted budget requests that have been denied 9-1-1 funds. Attachment C itemizes the denied requests by fiscal year and by PSAP. The total amount of denied requests is approximately $19 million.

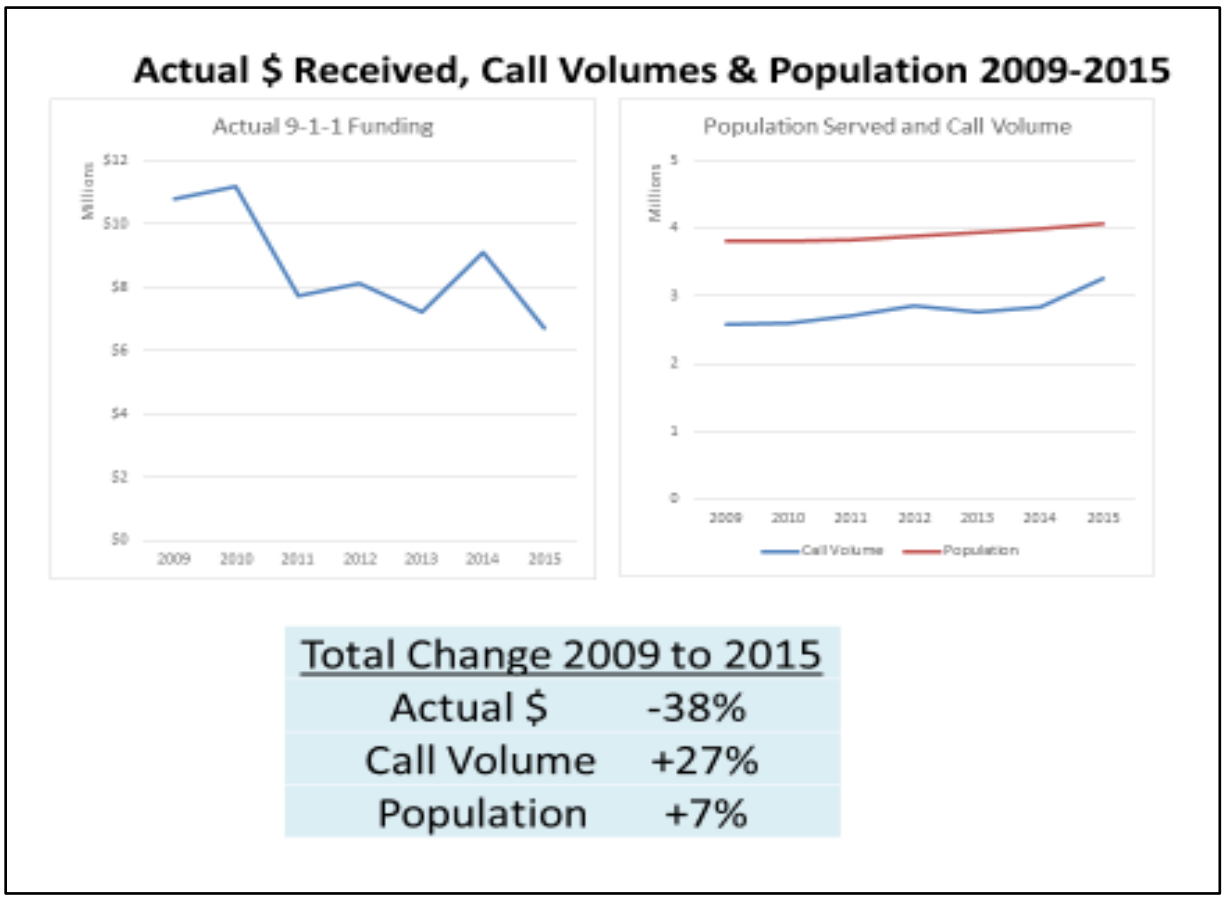
Fiscal Years 2007 through 2010 have no conditional or denied funding amounts. Denied funding first appears in FY 2011. In FY 2013, conditional funding begins on 9-1-1 equipment replacement requests. The denied funding amount's growth over each year is reflected on the growth of the next fiscal year's submitted budget. The submitted amount also reflects any conditional funding requests that were not granted in the previous fiscal year.



In FY 2016, more than $12.3 million was collected from the Maricopa Region for the 9-1-1 Excise Tax. The region saw a return of $6.1 million, marking a 49.8 percent return on taxes paid.



The amount of funding actually spent for the Maricopa Region 9-1-1 continues to decrease as 9-1-1 call volumes and population continue to increase as shown below.



Future of 9-1-1 in the Region

The Maricopa Region and other PSAPs throughout the industry are moving to an Internet Protocol (IP)-based communications system. The legacy analog 9-1-1 systems are unable to process IP data that many callers use through their cell phones, smart phones, and vehicle telematics (vehicle crash notification systems). A change in the funding model, money distribution and new technologies could provide the Maricopa Region with an IP 9-1-1 call delivery system with a platform to deliver IP-based communications. This system could meet the needs of the Maricopa Region's residents by allowing 9-1-1 calls to be placed through a variety of providers and a variety of devices.

This IP–based system would include all PSAPs within the Maricopa Region, as well as all 9-1-1 work stations. Attachment D contains a seven-year project plan for the Maricopa Region 9-1-1 System. The plan provides for a consistent equipment replacement plan to allow PSAPs to have an appropriate refresh of their equipment as well as core 9-1-1 networking equipment. Attachment E is a Gantt chart with the project plan timeline.

The system would have an Emergency Services IP Network (ESInet), which is a closed network that handles 9-1-1 call delivery. Attachment F is a high-level diagram of the ESInet needed for the Maricopa Region, a list of 9-1-1 IP system features required in the system and an indication of the features already in place.

The 9-1-1 ESInet would carry voice as well as 9-1-1 data. It is critical that any 9-1-1 network have built-in redundancy with multiple carriers. This follows the standards set by the National Emergency Number Association (NENA) "Next Generation 9-1-1" documentation and the FCC's Task Force on Optimal PSAP Architecture.

The 9-1-1 ESInet would need to be redundant and strong to ensure system integrity. It would need a minimum of two network centers in the Maricopa Region with the possibility of a third in the region or potentially a cloud-based center. It would include routing equipment that could handle IP traffic and a minimum of three carrier diverse network connections to each PSAP. The network centers would have a minimum of five carrier diverse network connections. This would avoid impacts to 9-1-1 if a carrier had network issues.

An ESInet 9-1-1 solution would allow for a caller to text, send a picture or video to the 9-1-1 operator. Data given to the 9-1-1 operator could be passed on to responding field units to assist them on the appropriate response.

Automatic crash notification systems are common in many new manufactured vehicles. An IP based 9-1-1 system could interface with crash notification monitoring companies to receive direct alerts, thus saving valuable time in sending resources to a crash scene.

The Maricopa 9-1-1 ESInet system would be able to communicate with other compliant 9-1-1 ESInet systems outside of Arizona. This would allow 9-1-1 callers to be transferred if emergency assistance is needed outside of the Maricopa Region or the State of Arizona.

9-1-1 system management would require system monitoring tools in place that would be able to provide MR 9-1-1 with all system metrics and alarms in near real time and detailed performance analysis for 9-1-1 calls from the moment the caller dialed 9-1-1 to the moment the caller

disconnected. These type of reports would give valuable information on the 9-1-1 system's health, identify 9-1-1 calling trends, and result in faster reporting time on system issues.

PSAP monitoring tools for the PSAP Manager could be an application on a mobile device. Firewalls installed at each PSAP would allow for modern data exchange for external PSAP use.

Session Border Controllers components could be installed to safely interface with MAG agencies' IP telephone systems. This would allow IP administration calls (non-9-1-1) to be passed to the call taker. Administration calls are non-emergency calls received at the PSAPs from the public using the agency's 10-digit telephone number.

Any Next Generation 9-1-1 solution should keep in mind the needs and requirements of the jurisdictions it is serving.

Conclusion

Since 1985, the MAG Region has worked to ensure that the public may be certain that they can access 9-1-1 in times of emergency. The Maricopa Region 9-1-1 system has been developed to meet rapid changes in technology and growing populations despite declines in the statewide 9-1-1 excise tax, sweeps of the 9-1-1 fund and suspension of funding requests for certain items.

MR 9-1-1 is considered a national leader in delivering critical 9-1-1 services to a population of more than four million people. MAG will continue to work to provide high quality 9-1-1 to the region while navigating difficult fiscal, technical and policy issues. The Co-Chairs of the 9-1-1 Study Committee have met with representatives of the State 9-1-1 Office to discuss formalizing a plan that would provide the Maricopa Region with a consistent, reasonable and justifiable distribution the 9-1-1 funds. We look forward to informing the region's opportunities and needs of the regional 9-1-1 system with the Governor's Office and State Legislature and we will continue working with our partners at the Arizona Department of Administration.

Attachment A

Attachment B

Attachment C

Attachment D

Attachment E

Attachment F